



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/483,569	01/14/2000	Stephen S. Oh	TI-23373	8551

23494 7590 02/07/2005

TEXAS INSTRUMENTS INCORPORATED  
P O BOX 655474, M/S 3999  
DALLAS, TX 75265

EXAMINER

SMITS, TALIVALDIS IVARS

ART UNIT	PAPER NUMBER
----------	--------------

2655

DATE MAILED: 02/07/2005

17

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/483,569

Applicant(s)

OH ET AL.

Examiner

Tāivaldis Ivars Šmits

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 8/31/2004 and 10/29/2004/.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 9-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 9-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Response to BPAI Decision and Amendment***

In response to the Decision of August 31, 2004 by the Board of Patent Appeals and Interferences, providing rejections within 37 CFR 1.196(b), rejecting claims 1-3 and 9-11 under the first and second paragraphs of 35 USC 112, and applicant's submission of an Amendment on October 29, 2004, attempting to traverse this rejection, by amending claims 1 and 9, the finality of the appealed action is withdrawn, and the following claim rejection is made.

### ***Response to Arguments***

Applicant's arguments filed in the Amendment of October 29, 2004, have been fully considered but they are not persuasive, for the following reasons.

As for the assertion that Bloebaum's cited formula "is not smoothing the power estimate as claimed" (Amendment, p. 8), the mentioned N and S in Bloebaum **are** power estimates, and thus the input S is signal power when the signal is present and is noise power when the signal is absent, thus, respectively, providing smoothed signal and noise power estimates.

As for the assertion that Bloebaum's smoothed signal and noise power estimates are not used to compute his gain function (Amendment, p. 9), this is clearly false, since the gain is computed in the spectral enhancement filter (element 52 of Figure 3), which clearly gets inputs from the smoothed signal power computation element (56) therein

Art Unit: 2655

and the smoothed noise power computation element (46, its output going through element 56 on the way to element 52, as indicated by the corresponding arrows in Figure 1).

Thus, claims 1-3 and 9-11 stay rejected, *mutatis mutandis*, even after the amendment of claims 1 and 9, as indicated next.

***. Claim Rejections - 35 USC § 103***

The text of the section of Title 35, U.S. Code not included in this action can be found in a previous Office Action.

Claims 1-3 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leland S. Bloebaum *et al.* (U.S. Patent 6,070,137, filed January 7, 1998).

As per claims 1 and 9, Bloebaum *et al.* teach:

- Receiving a stream of sampled acoustic signals and digitizing each sampled acoustic signal thereby forming digital samples (sampler, Fig. 3, element 26);
- selecting a fixed number of digital samples by multiplying the digital samples by a windowing function (signals converted into frames, col. 4, lines 24-25);
- computing the Fast-Fourier-Transform of the selected windowed digital samples to yield transformed windowed signals (DFT, Figure 3, element 42 with col. 5, lines 10-11);

Art Unit: 2655

- selecting half the Fourier-transformed windowed signal data (single-sided, frequency-domain representation because of the complex-conjugate symmetry of a Fast Fourier Transform of real signals, col. 5, lines 8-10);
- calculating a power estimate (power spectral density, col. 5, lines 17-19);
- calculating a smoothed power estimate over time by smoothing the power estimate using the recited (*i.e.*, first-order AR smoothing) equation (Fig. 5, element 64 with "smoothed version of S" in col. 8, lines 6-8; *cf.* first-order AR smoothing, col. 5, lines 38-44), wherein
- noting that S is signal power with signal present and noise power when signal is absent. thus also calculating a noise estimate
- calculates a gain function from the signal and noise power estimates (enhancement filter, col. 6, lines 8-10); and
- calculating a transformed signal by multiplying the gain function with the transformed windowed signal (col. 6, line 35-41).

Bloebaum *et al.* are interested in speech (voice) *coding* rather than speech *decoding*, and thus do not explicitly teach calculating an (enhanced) speech signal by calculating an inverse FFT on the transformed window signal to yield a sampled speech signal. However this is suggested by them, since the examiner takes Official Notice that an artisan at the time of invention would have known, from her required digital signal analysis course, to obtain back a time-domain version thereof, consisting of a sampled speech signal, for playback to the listener

As per claims 2 and 10, Bloebaum *et al.* do not teach a frame size of 32 samples. However, the examiner takes Official Notice that it was well known at the time of invention to use a "power of two" sample size for FFT processing and that standard speech frame sizes are 2.5, 5, 10, and 20 milliseconds, and that 32 samples would correspond to somewhere between 5 and 2.5 milliseconds of speech data at the standard sampling rates. It would have been obvious for one of ordinary skill at the time of invention to use such standard speech frame sizes so as to enable her to use conveniently-available standard signal processing hardware and software.

As per claims 3 and 11, Bloebaum *et al.* do not say what inherent window they are using. However, the examiner takes Official Notice that at the time of invention it was notoriously well-known to use a Hanning (raised cosine) window. It would have been obvious for one of ordinary skill at the time of invention to use a Hanning window, because of its enables one to do easy "unwindowing" by the addition after inverse FFT, when using 50 percent time frame overlap.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Talivaldis Ivars Smits whose telephone number is (703) 306-3011. The examiner can normally be reached on 8:30 a.m. to 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz, can be reached at (703) 308-1296. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

2/4/2005

  
TĀLIVALDIS IVARS ŠMITS  
PRIMARY EXAMINER